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M E T H O D
O F
PREVENTING AND REMOVING
THE CAUSES OF
INFECTIOUS DISEASES,

WRITTEN IN PLAIN SIMPLE LANGUAGE,

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P R E F A C E.

THE intention of the following pages, is to point out the most material causes, that occur in a large Town, to give rise to infectious diseases ; to shew the steps necessary to be taken to prevent such sources of contagion ; and to advise some precautions to be used, that are most likely to prevent infection, during the prevalence of these disorders.

A performance of this nature carried to its full extent, might be made to fill a volume ; but I have industriously studied to make every direction as short, and concise as possible ; for had I entered more largely into the subject, I must have written a
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book that would only have been read by a few, whereas this small pamphlet can readily be obtained by most people. I have given my opinion in the form of paragraphs, as I imagine that this mode of giving directions is the easiest to be understood, since by this means the mind is not fatigued with a chain of reasoning. I have avoided all reasoning on the propriety of any direction that I have given, as I trust that it will appear self-evident; and had I entered into a vindication and discussion of the utility of what is recommended in each paragraph, I should not only have made these pages too numerous to be generally read, but should have been obliged to have recourse to scientific reasoning, that could only have been intelligible to those of my own profession. I have therefore carefully

ly shunned every professional Term ; a circumstance that should always be attended to, by those that write for the benefit of mankind,

I do not pretend to say, that the following pages contain every direction, that may on some occasions be necessary, to prevent or remove the causes of infectious disorders ; I will only venture to say, that on all occasions, what I have given will be essentially requisite ; and are proper to constitute the grand outlines, of any regulations that may be deemed necessary, to prevent and remove contagious diseases from a City. I have likewise added, by way of postscript to my plan, some directions that from experience have been found serviceable, to such as visit unhealthy climates ; which I thought would not be

be unacceptable to the inhabitants of a large commercial City.

Small as this performance is, I doubt not but that it may meet with critical censure from some; but as men of discernment, will I hope always judge for themselves, and allow their opinions to be swayed only by the cool decision of an unprejudiced mind, I shall always despise whatever impotent censure may proceed from motives of ungenerous self-interest.

THE

T H E

M E T H O D

• F

PREVENTING AND REMOVING

THE CAUSES OF

INFECTIOUS DISEASES.

I. **T**HE health of the Inhabitants of every large Town, depends very much on the police of the place, and on the due performance of every duty connected therewith.

II. As the establishment, as well as the execution of every regulation, made either for the convenience or health of a City,
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are more immediately connected with the functions of magistracy, the Magistrates are in some measure answerable to the Inhabitants, in so far at least, as to enforce a proper obedience to, and of course a perfect performance of every law, that for these purposes may have been adopted.

III. The first material consideration for preserving the health of the Inhabitants in a large Town, is a rigid attention, to every step that can tend to produce cleanliness; and in the laying out of every additional building, to secure a free communication of pure air, and a facility of preserving cleanliness, ought always to be kept in view by those that have the management of the police.

IV. Nor should a house be built in a place likely to prove unhealthy, since not only its own inhabitants would suffer, but it would readily become a source of infection to the most extensive City.

V. In building a Town, the streets ought to be so wide as to insure a free circulation of air, and the wider the streets are in any

B Town,

Town, the more healthy will the inhabitants be found; whereas narrow streets, by admitting a less proportion of pure air, have every chance of creating infectious diseases.

VI. When it can be done, houses ought to be built on the north side of any marsh, swampy ground, or large rivers, that are apt often to ebb and flow, rather than on the south side of such places: Because from these, the sun powerfully exhales such vapours, as by being breathed or otherwise applied to the body, are capable of producing many contagious diseases. Whereas the inhabitants on the north side of such places, are in no risque of being exposed to these ascending vapours. Houses built on the north-west of a large Town, will always prove the most healthy.

VII. All slaughter-houses, and butcheries, ought to be in the south of every Town; and the Magistrates ought to enforce the greatest cleanliness in these places, that the nature of such business can admit of; and the filth produced in such places ought not to pass through any channel, that goes through

through the City. The most certain way of preventing diseases from arising in consequence of the filth of such places, is by obliging the butchers, &c. to bury all offal, blood, &c. before they have time to become offensive, or to remove them to some distant place from the City.

VIII. That of slaughtering animals in the streets, and permitting the blood, &c. to remain there, ought to be made highly criminal, and punished accordingly.

IX. All dead horses, dogs, cats, &c. ought to be buried, or carried to some distant place; nothing gives a stranger a meaner idea of the taste of the inhabitants of a Town, or produces more certain sources of contagious diseases, than to see such dead animals laying about the streets*.

X. Tan-

* We have a well authenticated account of a very violent infectious fever breaking out at Egmont in North Holland, occasioned by the rotting of a Whale, which had been left on the shore. There is likewise an instance of a contagious fever breaking out in the crew of a French ship, owing to the putrefaction of some cattle that they had killed on the island of Nevis, in the West-Indies.

X. Tan-yards, and such factories as produce offensive smells, ought never to be permitted in the middle of any large Town. They ought only to be in such parts as have least communication with the inhabitants at large.

XI. All filth should be removed from every street and lane, early every morning, and carried to a common reservoir at a considerable distance from the Town; and people should be appointed, so many to each district, whose business it ought to be during the day, to carry entirely out of the Town, whatever filth or dirt may be produced on the streets. That of collecting dunghills on the streets, and allowing them to remain there, during the pleasure of a Scavenger, is very hurtful to the health of the inhabitants,

XII. Common sewers, or shores, ought to extend through every street, and should empty themselves entirely out of, or at some distance from the Town; and great care should be taken to keep them perfectly free, and fit for their duty; it likewise ought to be a punishable crime, to throw
any

any thing into a shore that might tend to choke it up.

XIII. The establishing of publick Privies, or Necessary-houses, in convenient parts of a Town, is essential to its cleanliness; as the want of such places of convenience, is a material cause of the filth so frequently found in lanes, &c.

XIV. Such publick Necessary-houses, ought to be carefully attended to, by the police officers, and so constructed as to be easily cleaned, which ought to be done very early every morning *.

XV. A plen-

* When large armies have been long encamped on the same ground, putrid diseases frequently arise, in consequence of the filth unavoidably produced by a large body of people, for a length of time occupying the same place; and the only mode of restoring health to the army, has been found, to be that of removing the camp to new ground; and an army is generally most healthy, where the nature of the service makes it necessary, for the army to move frequently. This mode, so well known to the moderns, was sometimes practiced by the ancient Generals. Vegetius seems to have been well acquainted with the necessity of cleanliness to remove or prevent contagious diseases, for in his system *de Re Militari*, he uses these words, “ Si autumnali, æstivoque tempore diutius in iisdem locis militum multitudo consistat,

XV. A plentiful supply of good water is inseparably connected with the health of a Town; the houses of opulent individuals being provided with good water by means

ex contagione aquarum, et odoris ipsius fœditate vitiatis haustibus, et aere corrupto, perniciosissimus nascitur morbus, qui prohiberi non potest aliter, nisi frequenti mutatione castrorum." *VEGET. de Re Militari*, lib. iii. cap. 2. Quintus Curtius likewise tells of Alexander the Great after the battle of Arbela, being obliged to follow the same method to preserve the health of the soldiery. "Ingruentibus deinde morbis, quos odor cadaverum totis jacentium campis vulgaverat, maturius castra movit." lib. v. 32. And in the most ancient times we find that cleanliness was reckoned essential to the preservation of health; and the proper injunctions for that purpose, were by no means supposed incompatible with the dignity of those highest in power. Thus we find the divine law-giver Moses, enjoining cleanliness in the camp of the Jews, in a most particular manner, when he says. "Thou shalt have a place also without the camp, whether thou shalt go forth abroad: and thou shalt have a paddle on thy weapon, and it shall be when thou wilt ease thyself abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee. For the Lord thy God walketh in the midst of thy camp, to deliver thee, and to give up thine enemies before thee: therefore shall thy camp be holy, that he see no unclean thing in thee, and turn away from thee," *DEUT. chap. xxiii. ver. 12, 13, 14.*—Since then we find how frequently contagious diseases are produced in a camp, by a great body of people collected together, while at the same

means of pipes, is of small benefit to those of inferior circumstances, that in all nations constitute the great body of the people.

XVI. The easy attainment of an ample supply of this necessary article in life to the people at large, merits the greatest attention of the police. In many Towns where good water can only be obtained at a distance, publick pipes that conduct the water from the grand reservoir are established in convenient quarters of the Town, by which means the poor are enabled to partake of this common bounty of providence, in as great perfection as the rich.

XVII. Jails, Poor-houses, and Hospitals, ought always to be in the most remote quarters of a Town; but at the same time in

time, the most judicious regulations for preserving cleanliness, are by military discipline better enforced, than perhaps the best regulated civil police can ever accomplish; and since it is evident, that the inhabitants of a Town, cannot avail themselves of changing ground, and thereby leaving behind them whatever might tend to produce diseases, it is easy to see how essentially necessary it must be to take every step, that can tend to prevent the direful consequences arising from putrid substances laying in, and about a Town.

in such places as are little likely by situation to become unhealthy, least they should turn out nurseries for propagating diseases.

XVIII. An officer of the police ought daily to visit every part of the jail, poor-house, and other publick charity, to enforce a due obedience, to such orders as the police may think proper to make, for the regulation of such places; and the visiting officer should be authorised, to inflict such punishment as may seem necessary (and as may have been fixed by the police) for any neglect of duty, or disobedience of orders, that the respective officers of such places may be found guilty of.

XIX. In all jails, poor-houses, &c. the utmost attention should be paid, to the shirts and shifts of the prisoners in jail, and the inhabitants of a poor house. Their linen ought to be changed at least twice a week, and the officer of police should not only enforce this order, but should take care that the linen has been properly washed, and well aired before it is given to wear.

XX. All

XX. All jails, poor-houses, &c. ought to be provided with a sufficient quantity of linen, to supply such as may be sent there without a sufficiency of this necessary article; and those who have the care of such places, ought to be answerable, that such linen is kept in good order, and always forth coming. And every jail should be supplied with a quantity of good blanketting.

XXI. Every room in jail, poor-house, &c. ought to be swept carefully every morning, the sides and ceiling as well as the floor ought to undergo this operation; and the straw and other bedding, when the weather is dry, ought to be carried out, and laid in a yard (that ought always to belong to a jail) for the benefit of the air, five or six hours every day.

XXII. As soon as the straw, bedding, &c. has been carried out of the different rooms, the floors ought to be strewn over with sand or saw-dust, which next morning is to be swept out, and the same process to be repeated every day.

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XXIII. When

XXIII. When wet weather renders the carrying into the air of the straw and other bedding inadmissible, they should be removed into a corner of the room, to permit it to undergo the directions ordered as above.

XXIV. The straw for a jail, poor-house, &c. ought to be changed at least once every month, and care should be taken that the old straw is either burnt, or carried to some distance from the Town.

XXV. If feather-beds, or hair-mattresses, are ever used in a jail, poor-house, &c. besides being regularly exposed to the free air, on every dry day, they ought to be fumigated once a week, by being held at a proper distance over the smoke of burning brimstone, or gun-powder.

XXVI. All sheeting should be changed once a fortnight, and the sheets and blankets when the weather will permit, ought to be put on ropes fixed in the yard for the purpose of exposing them to the action of the air.

XXVII. Eve-

XXVII. Every boarded floor should be washed with soap and water once every week, and it ought to be done in the morning of a dry day, that the inhabitants of the room may be enabled to remain in the yard, till the floor is perfectly dry and covered over with sand. The sides of the room and ceiling should undergo the same operation.

XXVIII. All dungeons of a jail should have boarded bottoms, and their sides plaistered to make cleanliness the more practicable; but when these places happen to have clay floors, and rough walls for their sides, the floors and walls ought daily to be swept with a hard broom, and the walls once a week, ought to be washed by throwing soap and water upon them with a mop, after which they may be dried by carefully sweeping with a broom, and by burning some fuel in a chaffing dish; a practice that ought frequently to be used in all subterraneous apartments, and which ought likewise to be had recourse to in all rooms in jails, poor-houses, &c.

XXIX. Every room should have its windows so situated, as to admit of a free cur-

rent of fresh air at pleasure ; and all window sashes, when there is no rain, should be opened some hours every day.

XXX. Every jail, and poor-house or other charity, ought to have a commodious yard annexed to it, and a privy should be situated in some part of it, that will prove least offensive. Into these privies all chamber-pots, &c. should be emptied, and the regular cleaning of such privies, should be carefully attended to.

XXXI. Every prisoner in jail, ought to be (unless prevented by sickness) made to remain in the yard for some hours every day in fair weather, and as a military guard attends on every jail, a proper number of centinels being posted in the yard, would render the walking about of those condemned to die, perfectly admissible. Every prisoner ought to twig and brush his cloaths in the yard, every day in dry weather.

XXXII. A separate building with convenient rooms ought to belong to every jail, and publick building, for the purpose of an
hospital

hospital for the sick, and when this cannot be had, a sufficient number of rooms belonging to the building itself, should be appropriated to that purpose.

XXXIII. As the regulation of the apartments for the sick will necessarily belong to the Faculty that attend them, I reckon any directions on that head unnecessary.

XXXIV. Whenever any person belonging to a jail, or other publick building is taken sick, he ought immediately to be reported to the Surgeon, or Physician, and the person taken ill, should be removed to the hospital.

XXXV. Men of the first abilities only, in physic and surgery, should be entrusted with the care of the sick, the consequence of delegating this important office, to the charge of an apothecary is highly dangerous to the inhabitants at large. Since in all such places, infectious diseases are more likely to break out than any where else, it follows, that the practitioners should be such, as by their abilities are best able, speedily to put a stop to them.

XXXVI. In

XXXVI. In every large Town there ought to be commodious hospitals for the reception of medical, as well as surgical patients, and in such hospitals there should be a suite of rooms for the accommodation of such servants of the inhabitants of the Town, as may be taken ill of infectious diseases *.

XXXVII. There should likewise be a publick Dispensary, where such of the diseased poor whose cases do not require confinement, may receive medicine and advice, and the medical attendants of the Dispensary should visit such as are confined at home, whenever the hospitals happen to be full.

XXXVIII. Whenever any infectious disease appears in a Town, it ought immediately to be reported to the chief magistrate, who ought to summon a meeting of the police, to consult with some of the most eminent of the Faculty, on such steps as by being carried into execution, may be most likely to put a stop to its progress.

XXXIX. Every

* The happy effects of such an institution are amply felt by the inhabitants of Edinburgh.

XXXIX. Every person that dies of any infectious disease, ought to be buried in twenty-four hours after death; and when infectious diseases prevail and great mortality, the ringing of bells at deaths and funerals should be strictly prohibited. And the idle, dissipated custom of a number of people assembling at wakes, ought on all such occasions to be forbidden, as such a practice is extremely dangerous.

XL. Those who attend funeral ceremonies, should not perform these duties with an empty stomach, for in this situation they will be more apt to catch infection, both from the corpse, and the hurtful vapours that arise from a newly opened grave, than after a meal.

XLI. When infectious diseases are prevalent in a Town, it will be of great service to burn gun-powder in the streets, and to make fires in different parts of the Town, of any wood that abounds with resin, such as the different species of fir.

XLII. In every house where there is any infectious fever, vinegar ought several
times

times in the day to be boiled, and sprinkled while hot in every room; and a sauce-pan filled with hot vinegar, should always be kept in the patients chamber. The burning of frankincense * is very pleasant to the smell, and very powerful in purifying putrid air.

XLIII. When infectious diseases prevail, every attention to cleanliness of person should be doubled, particularly in regard to linen; for during such times the perspiration sooner becomes hurtful, and more powerful in producing a contagious matter capable of bringing on a fever, than when such diseases are not general.

XLIV. All

* I remember to have checked the progress of a very contagious fever by this mode, after all others had failed, in a Barrack situated in the middle of the Bog of Allen. The smoke of the Juniper, or of its roots and berries, has long been esteemed an efficacious remedy against distempers; and Mindererus in his *Medicina Militaris*, advises to burn fires of Juniper before the tents, when the Hungarian-disorder, the spotted-fever, or other pestilential disorders are frequent in an army.—During the continuance of infectious diseases, fires ought to be burnt in every house, whenever the temperature of the the weather permits,

XLIV. All attendants on the sick in such fevers, should be careful in holding the head as little over the patient as possible, or in speaking very near to the patient: this caution is to prevent the hurtful effluvia (that are more powerful in proportion as they are near to the patient) from entering the lungs.

XLV. When the Faculty, Clergy, or others that may for any time be obliged to stay by the patients bed-side, are there, a vessel containing warm vinegar ought to be placed near them; and it is better to smell to any grateful substance, than to chew any thing as a preventative, because in doing the latter there is danger of the infectious matter being entangled with the spittle, and thereby of producing what it was intended to prevent.

XLVI. Whenever a person dies of any contagious disease, the corpse ought quickly after death to be put into a close coffin, and the room in which the person died should be well aired, by having the windows opened, until a charcoal fire be kindled with some rolls of sulphur upon it;

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after

after which both doors and windows ought to be kept shut, for a considerable time, not less than eight or ten hours, until the room be thoroughly smoked; after which the windows ought to be again opened for several hours, and the room should not only be well scoured with soap and water, but likewise with warm vinegar, before any one inhabits it. The same steps ought to be taken with every room in which an infectious disease has been, though the patient may have recovered: and for this purpose it is proper that whenever a person is so far recovered from any contagious disease, as to admit of being moved with safety, the patient should be conveyed to another chamber, to permit the one occupied during the disease to undergo the necessary purification.

XLVII. It may perhaps be proper to observe, that the blankets, linen, &c. of such as die of infectious diseases, ought to be steeped for some time in cold water, before they undergo the usual process of being washed: for if without this precaution they were to be washed in hot water in the usual manner, the hurtful steams that
would

would thereby be produced, might prove very dangerous to the person employed in washing them.

XLVIII. Those whose duty it may be to go amongst the sick, ought never to perform that duty fasting; even a small quantity of aliment taken into the stomach, gives great vigour to the whole body; and the body is more or less likely to be affected with contagion, in proportion to the state of strength or weakness of the stomach: It is therefore proper for those that are obliged to have much intercourse with the sick in contagious diseases, to take a dose of some comfortable stomachic medicine every morning an hour before breakfast; and I have from much experience found, that an ounce of Huxham's Tincture of Bark, is as useful a preventative as can be taken *.

XLIX. What-

* Some people labour under diseases that render the use of bark improper, and in such cases, I would as a preventative against infection recommend an ounce of Rue, and half an ounce of Garlick, to be steeped in a quart of Brandy, for two days, and a wine glass-full of this Tincture to be taken every morning before breakfast.

XLIX. Whatever effects the strength of the stomach, has a powerful effect in producing or preventing contagious diseases; therefore every step ought to be taken, to keep that organ in the utmost vigour during the prevalence of infectious diseases: and for this purpose, the utmost circumspection in the way of living ought to be attended to, and all such food as has been generally found to disagree with the stomach, ought on such occasions to be carefully avoided.

L. A due quantity of generous wine, should be used by every one whose circumstances will admit of it; at the same time, I think it necessary to say that excess in drinking, by leaving the stomach, and of course the whole body in a weakened state, would prove hurtful. Excess in eating on all such occasions should be carefully avoided, as being capable of throwing the stomach into that state, that may readily invite any infectious disorder; nay some of the ancient physicians reckoned any excess in eating, more dangerous than that of drinking, for Celsus says, “ Si qua, intemperantia subest, tutior est in potione, quam
in

in efca." that is, it is fafer to exceed in drinking than in eating. But every kind of intemperance is hurtful.

LI. During the continuance of contagious difeases, it is improper to go abroad into the ftreets before breakfast, and it would be proper for thofe that are obliged to go abroad before this meal, to take a draught of new milk to which a little good brandy has been added.

LII. Such as have weak ftomachs and are not able to make a hearty breakfast, ought to take a glafs or two of good wine, fome time before dinner; the addition of a little bark to the wine would be of fervice *.

LIII. A mo-

* During the campain in Hungary, in the year 1717, Count Boneval preferved both himfelf and family from diforders, by taking himfelf, and making all his domeftics take, two or three times a day, a fmall quantity of Brandy in which Bark had been infufed, at a time when all the reft of the army were infected with malignant diforders.—A regiment in Italy continued healthy by the ufe of the Bark, when the reft of the Aultrian army, that did not purfue the fame method were greatly annoyed with ficknefs.

LIII. A moderate use of ripe fruit, is of great service in preventing putrid diseases; and vegetable acids such as lemon juice, &c. when they agree with the bowels are very proper ingredients in drink. The best time for eating fruit is two or three hours before dinner.

LIV. Sitting up late, and laying long in bed, are hurtful at all times, but by weakening the body become particularly dangerous during the prevalence of infectious diseases

Towards the end of the year 1743, Mr. Tough, then a mate to a regiment, was ordered to go down the Rhine from Germany to Flanders, with a party of sick, that had the seeds of the Hospital or Jail-fever among them, and were to go in Bilanders. Having had a cask or two of Brandy put on board as stores for the sick, he was afraid lest the men should make too free with the spirits, to prevent which he threw a quantity of Bark into each cask, and gave the men regularly morning and evening, a glass of this bitter tincture. At the same time the men were kept extremely clean. By these means most of the sick mended on the passage, and they had no return of the malignant fever amongst them; whereas Sir John Pringle, who takes notice of the other parties that came from the same Hospitals in Germany, tells us, that the malignant fever broke out in a violent degree, and half the number died by the way, and several others soon after their arrival.

diseases. A moderate degree of exercise in the open air which is at all times proper for health, is particularly necessary when contagion reigns. Cold bathing is an useful assistant in the prevention of diseases.

LV. Nothing so much predisposes a person to receive infection, as to entertain a constant dread of catching any disease. Nothing weakens the whole body so much as constant anxiety and fear; and as I have already remarked, whatever tends to diminish the vigour of the body, acts powerfully in laying the foundation of disease. A fearless disposition is best calculated to enable the body to resist any contagious disorder *.

LVI. Nothing

* We have a striking instance of the dangerous consequence of fear, in the case of a man at Constantinople, when the plague happened to rage there with unusual violence. This man from a natural intrepidity of mind, had been extremely useful in carrying out of the city, and burying many hundreds that died, at a time when it was very difficult to find people hardy enough to perform this necessary duty. It happened however one morning that he found one of those he was carrying to bury to be one of his nearest relations and most intimate friends, by which he immediately became so much shocked, that he was speedily seized with the plague and died.

LVI. Nothing is more injurious to health than to walk late in the evening: dews begin to fall as soon as the sun is set, and walking abroad after this time, has in all countries been found to be a powerful cause of producing diseases.

POSTSCRIPT.

P O S T S C R I P T.

AS putrid diseases are very common and violent in hot countries, it is very necessary for Europeans who visit those climates to be well informed, of the signs of an unhealthy country, that they may be on their guard as soon as they enter any foreign region.

By the best judges the following are considered as chiefly demanding notice.

1. A sudden and great alteration in the air at sunset, from intolerable heat to a chilling cold. This is perceived as soon as the sun is down, and is for the most part accompanied with a heavy fall of dew; it shews an unhealthy swampy soil; the nature of which is such, that no sooner the sun-beams are withdrawn, than the vapours emitted from it, render the air damp, raw, and chilling in the most sultry climates; so that even under the equator in some un-
E healthy

healthy places, the night-air is very cold to an European constitution.

2. Thick fogs, chiefly after sun-set, arising from the valleys, and particularly from the mud, slime, and other impurities. In hot countries the smell of these fogs, may be compared to that of a new cleaned ditch. Diseases therefore arising from this cause, generally take place in the night, or before sun-rising.

3. Numerous swarms of flies, gnats, and other insects, which attend stagnated air, and unhealthy places covered with wood.

4. When all butchers meat soon corrupts, and in a few hours becomes full of maggots; when metals are quickly rusted on being exposed to the air; and when a corpse becomes intolerably offensive in less than six hours; these are proofs of a close, hot, and unwholesome country. And in such places during excessive heats and great calms, it is not uncommon for Europeans, especially such as are of a gross habit of body, to be seized at once with most alarming, and fatal symptoms of what is called the yellow-

yellow-fever, without even any previous complaint of sickness, or other symptom of the disease, and the patient has often been carried off in less than forty-eight hours.

5. A sort of sandy soil, commonly a small loose white sand, as that at Pensacola, Whydah, and the island of Bonavista, which is found by experience to be injurious to health. The pestiferous vapours arising during the summer months, and in the heat of the day from such a sandy soil, is best characterised from its effects in the extensive deserts of Asia and Africa. It there constitutes what is called the Samiel Wind; a blast which in the parched desert, proves instantly fatal both to man and beast; but when it passes over a soil well covered with grass and vegetables has its effects greatly mitigated: it is however even then always productive of sickness. Thus the southerly winds, while they blow from the deserts of Lybia, in the summer, at Algiers, Tunis, and Tripoli, produce an unhealthy season; and at Madras the winds, which in the months of April and May, pass over a large tract of sand, are always hot, disagreeable, and unwholesome.

During

During these land winds, sudden gusts of a more hot and suffocating nature, are often observed to come from those sands, once or twice, or even more frequently in a day, which seem to be this vapour in a purer form. These gusts pass very quickly, and affect persons who happen to stand with their faces towards them, in the same manner as the hot air, which issues from a burning furnace, or from a heated oven, and obliges them immediately to turn away from it in order to recover breath.

The effect of this hot suffocating blast on the human body, even when mitigated by passing through a moist atmosphere, is the same as that of intense cold; it shuts up every pore of the skin, and entirely stops the perspiration of such as are exposed to it. These blasts come only in the day time and always from the deserts.

Water is the only known corrector or antidote against them; hence, coarse thick clothes kept constantly wet, and hung up at the windows, or doors, greatly mitigate their violence. A house so built as to have no doors, or windows, towards the deserts,
is

is an excellent protection against their pernicious effects.

That the heat of these land-winds, as also of the sudden gusts which accompany them, proceed from large tracts of land, heated by the sun, is evident from the increased heat, and suffocating quality of those winds, in proportion as the day advances, and as the heat of the season is increased.

The opposite winds blowing from each side of the Balagate-Mountains, are a farther proof of this. Those mountains, running from north to south, divide the hither peninsula of India into two unequal parts, and separate what is called the Malabar, from the Coromandel coast. To the former they are very near, but at a great distance from the latter. The winds blowing from these hills, are on the Malabar coast always remarkably cool; but on the the coast of Coromandel, in the months of April, May, June, and July, are extremely hot and suffocating as they pass over a large tract of intermediate land, heated during these months by an almost vertical sun.

Hence

Hence the Malabar coast is always covered with an agreeable verdure; whereas the coast of Coromandel, during the continuance of these hot winds, seems a barren wilderness, nothing appearing green except the trees.

The next considerations for such as visit unhealthy climates, are such employments as are particularly dangerous to Europeans on their first arrival. And according to the opinion of Doctor Lind, of Haflar, who served long as a Surgeon in the Royal Navy, one of such dangerous employments is that of cutting down of trees, shrubs, &c. or clearing the ground, as it is called. Of the unhealthiness of this employment there are two remarkable instances. At the conclusion of the former war, the captain of a ship went on shore at the island of Dominica, with twelve of his men, to cut down the wood, and clear a piece of ground, which he intended to have purchased; but in a few days sickness obliged him to desist from this dangerous work; the captain and eleven of his men being seized with violent fevers which ended in obstinate agues, and of which several died; and the

the survivors, during their lives, had fits of the ague on the return of an east wind.

The Ludlow-castle, a ship of war, in a voyage to the Coast of Guinea, also lost twenty-five of her men, at Sierra Leona, who were employed in cutting down wood for the ship. This is an occupation that has often proved destructive to Europeans in those climates, and in which they ought never to be employed, especially during the rainy season; there being many instances of white persons, when cutting down the woods at that season, who have been taken ill in the morning, and have died before night.

Another evil not less dangerous, is the sending of Europeans in open boats after sunset, where the soil is swampy, or where there are great night fogs. The single duty of fetching fresh killed butchers meat, annually in the East and West Indies, destroys several thousand seamen. In those parts of the world, butchers meat must be brought on board at night immediately after it is killed, otherwise it will not be fit for use next day; but a contract made with
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the natives to send it on board, would be the means of preserving many useful lives.

At Batavia, a boat, belonging to the Medway man of war, that attended on shore every night, was three times successively manned, not one having survived that service. They were all taken ill in the night when on shore, or when returning on board; so that at length the officers were obliged to employ none but the natives on that service.

Since then it is so unhealthy for Europeans to be exposed in open boats to the night fog, it must appear, that sending them unsheltered in open boats, far up rivers in unhealthy climates, for wood, water, trade, or other purposes, must be attended with the most fatal consequences.

Burying the dead in swampy countries, is an occupation that has proved fatal to many, and which ought to be entrusted to the natives of the country. The effluvia from the ground when newly opened, whether from graves or ditches, are far more dangerous than from the same swampy soil,

foil, when the surface is undisturbed; nay, in some places it has been found almost certain death, for an European to dig a grave, unless long seasoned to the country.

In all cases where it is practicable, ships which visit those unhealthy countries, should anchor at as great distance as possible from shore; or if obliged to anchor near marshy grounds, or swamps, especially in summer, or hot weather, and when the wind blows directly from thence, the gun-ports in ships of war, that would admit the hurtful land breeze ought to be kept shut, especially at night. Or if the ship rides with her head to the wind, a thick sail ought to be put on the foremast, along which the smoke from the fire-place might be made to play and ascend; any inconvenience that the smoke might occasion, would be amply compensated, by its keeping off the direct steam, of the swampy vapour. The best preventative against the the mischevous impression of a putrid fog, or of a marshy exhalation, is a close, sheltered, and covered place, such as the lower apartments of a ship, or a house, in which there are no doors or windows facing the

F swamps,

Swamps. If in such places a fire is kept, either at the doors or other inlets to a house, or in the chambers, as is practised in some unhealthy countries during the rainy or foggy season, it will prove an excellent and effectual protection against the injuries of bad air. On board of ships also, fires may be made at the hatchways; and of the good effects of this, we have the following example. When the Edgar, a ship of war of sixty guns, was upon the coast of Guinea, in the year 1768, her men were very sickly and many of them died; whereas it was observed, that in a sloop of war, that was constantly in company with her, few were taken ill, and not one died during the whole voyage. This could be ascribed to no other cause, but that in the sloop the fire-place for cooking victuals, was on the the same level with the deck where the men lay; and every morning when the fire was lighted, especially when there was but little wind, the smoke from the cook-room spread itself all over the ship, and particularly over those parts where the men lay; but from the construction of the fire-place of the Edgar, no smoke from it ever came between her decks. Persons on board any
ship

ship whatever are much safer, than those that make inland excursions in open boats. The intolerable heat at noon often obliges such persons to be in a manner half-naked; while a violent sweat issues from every pore on the skin.

An approach to unwholesome swamps, at this time, is apt to produce every symptom of the most dangerous fever. But if they happen to pass them at night, or lay near them in an open boat, the air from those swamps is perceived to be quite chill and cold; in so much that warm thick clothing becomes absolutely necessary, to guard the body against the impressions of so great an alteration in the air, and against its hurtful quality, for its effects then on the most healthy often produce diseases that quickly terminate in death.

But when such exposure becomes unavoidable, the only method is then to defend the body as much as possible against the pernicious effluvia with which the air abounds. Those employed in cutting down wood, or in other laborious and dangerous services in hot climates, during the heat of
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the day, ought to have their heads covered with a bladder dipt in vinegar, and to wash their mouths with the same liquor; and they ought morning and evening to take a dose of Tincture of Bark.

They should leave off labour before sunset, and not return to work till the sun has had time to disperse the unwholesome vapours and dews. Those who from necessity must remain on shore, and sleep in dangerous places, must take care not to sleep on the ground, exposed to dews, but in hammocks in a close tent, standing on a dry sand, gravel, or chalk, near the sea-shore. The door of this tent should open to the sea, and the back part should be protected from the land breeze, by being secured with double canvass, covered with branches of trees. But in such cases a hut is preferable to a tent, if it is well thatched, to prove a defence from the heat of the sun by day, and from the dews by night.

When the air is chill, and moist, a fire should be kept in and about the tent or hut, as the best means of purifying such unwholesome air.

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It is the custom with the Negros in Guinea, as also of some Indians, to have a fire producing a little smoke, constantly burning in their huts where they sleep. This not only corrects the moisture of the night, but also, by occasioning more smoke than heat, renders the damp from the earth less hurtful. Doctor Lind gives us an instance of a Guinea ship being up one of the rivers for trade, and it was found to be very dangerous to sleep on shore, without which their trade could not be so conveniently carried on. First the captain, then the mate, and two or three of the seamen were taken ill; each of them the morning after they had lain on shore. By these accidents the men were greatly intimidated from laying on shore, till the surgeon offered to try the experiment on himself. Next morning, when he awaked, he found himself seized as the rest, with every symptom of fever. He immediately acquainted one of the Negroes with his situation, who carried him to his hut, and set him down in the smoke of it; when all the symptoms of fever soon left him: he then took a dose of the Tincture of Bark, and found himself very well.

Thus

Thus instructed by the Negroe, he ordered a large fire to dry the hut he slept in; and afterwards had every night, a small fire sufficient to raise a gentle smoke, without occasioning a troublesome heat; and by these means, he and several others using the same precautions, slept many nights on shore without any inconvenience.

I should next proceed to give some directions concerning the mode of living that ought to be followed by Europeans in warm climates; but as the limits fixed for these pages, prevent my entering fully into the subject, I am obliged with some reluctance to conclude this performance, by mentioning that together with the causes produced by an unwholesome climate, the excesses of European debaucheries carried into those countries, tend greatly to bring on diseases. Good living is in all countries necessary to health; but excess of drinking in a warm climate is a matter of serious consequence. In short, the utmost attention should be paid to cleanliness; to use food as easy of digestion as can be procured, to avoid fatigue, and all excess in living.

ing. I therefore beg leave to recommend the advice given by Celsus, as well meriting the utmost attention by those exposed to unhealthy climates. " Tum calorem, frigus, libidinem, cruditatem, fatigationem vitare oportet." Celsus, lib. i. cap. 10.

ERRATA.

Page 24, line 13. for contageous, read contagious. P. 28, l. 1. for effects, read affects. P. 29, l. 17. for campaign, read campaign. P. 40, l. 11. for fereice, read service. P. 41, l. 23, for mischevous, read mischievous. P. 45, l. 1. for Negros, read Negroes.

FINIS.